

REMARKS

This is in full and timely response the non-final Office Action mailed on January 12, 2007.

Claims 25-26 and 31-42 are currently pending in this application, with claims 25, 26 and 31 being independent. *No new matter has been added.*

Reexamination in light of the following remarks is respectfully requested.

Rejections under 35 U.S.C. §102

Paragraph 2 of the Office Action indicates a rejection of claims 21-30 under 35 U.S.C. §102 as allegedly being anticipated by U.S. Patent Application No. 2001/0055733 to Irie et al. (Irie)

This rejection is traversed at least for the following reasons.

At least for the following reasons, if the allowance of the claims is not forthcoming at the very least and a new ground of rejection made, then a **new non-final Office Action** is respectfully requested.

Claims 21-24 and 27-30 - While not conceding the propriety of this rejection and in order to advance the prosecution of the above-identified application, claims 21-24 and 27-30 without prejudice or disclaimer of their underlying subject matter, rendering the rejection of these claims as moot.

Claim 25 - Claim 25 has been placed into independent form. Claim 25 is drawn to a mask fabrication method comprising the steps of:

acquiring input data, said input data corresponding to an LSI pattern to be formed on a wafer;

dividing said input data into V-line data and H-line data, said V-line data corresponding to V-line pattern forming elements and said H-line data corresponding to H-line pattern forming elements;

forming a V-line reflective mask adapted to reflect a light onto said wafer, a mask pattern for said V-line reflective mask consisting of said V-line pattern forming elements;

forming an H-line reflective mask adapted to reflect said light onto said wafer, a mask pattern for said H-line reflective mask consisting of said H-line pattern forming elements; and

forming an absorption film on said V-line reflective mask, said absorption film being adapted to absorb said light.

Claim 26 - Claim 26 has been placed into independent form. Claim 26 is drawn to a mask fabrication method comprising the steps of:

acquiring input data, said input data corresponding to an LSI pattern to be formed on a wafer;

dividing said input data into V-line data and H-line data, said V-line data corresponding to V-line pattern forming elements and said H-line data corresponding to H-line pattern forming elements;

forming a V-line reflective mask adapted to reflect a light onto said wafer, a mask pattern for said V-line reflective mask consisting of said V-line pattern forming elements;

forming an H-line reflective mask adapted to reflect said light onto said wafer, a mask pattern for said H-line reflective mask consisting of said H-line pattern forming elements; and

forming an absorption film on said H-line reflective mask, said absorption film being adapted to absorb said light.

Irie - Irie arguably teaches an exposure method and exposure apparatus. Irie arguably teaches the presence of a master pattern 27 of the working reticle 34 (Irie at Figure 6, paragraph [0110]). Irie arguably teaches the presence of a parent pattern 36 (Irie at Figure 6, paragraph [0112]).

Irie arguably teaches that in an exposure apparatus using EUV rays, however, a reflection type mask is used, while in a proximity type X ray exposure apparatus or electron beam exposure apparatus etc., a transmission type mask (stencil mask, membrane mask) is used, so a silicon wafer etc. is used as the master of the mask (Irie at paragraph [0161]).

However, Irie fails to disclose, teach, or suggest the reflection type mask as having an absorption film formed thereon.

Withdrawal of this rejection and allowance of the claims is respectfully requested.

Newly added claims

Claims 31-42 - Claims 32-42 are dependent upon claim 31. Claim 31 is drawn to a mask fabrication method comprising the steps of:

acquiring input data, said graphic input data corresponding to an LSI pattern to be formed on a wafer;

dividing said graphic input data into V-line data and H-line data, said V-line data being said input data extending onto said wafer in a first direction and said H-line data being said input data extending onto said wafer in a direction other than said first direction;

forming a V-line reflective mask adapted to reflect a light onto said wafer, a mask pattern for said V-line reflective mask consisting only of V-line pattern forming elements; and

forming an H-line reflective mask adapted to reflect said light onto said wafer, a mask pattern for said H-line reflective mask consisting only of H-line pattern forming elements,

wherein said light is projected along a projection vector in a projection direction,

wherein said first direction is alignable in said projection direction, and

wherein said direction other than said first direction is alignable in said projection direction.

The following description is provided for illustrative purposes and is not intended to limit the scope of the invention. Paragraph [0029] of the specification as originally filed provides that:

Particularly, if, as explained in the above-mentioned embodiment, the exposure process is carried out twice by using the V-line mask 12a and the H-line mask 12b in this order, and the extending directions of the pattern forming elements 11a and 11b are aligned in the direction of the projection vector of the EUV ray, it becomes very effective in the case of improving the resolution of the projected image on the wafer 8 even when the EUV ray is incoming askew.

Irie - Irie arguably teaches the presence of illumination light IL and alignment marks 21A and 21B (Irie at Figure 4).

However, Irie fails to disclose, teach, or suggest that the illumination light IL light is projected along a projection vector in a projection direction, that the first direction is alignable in the projection direction, and that the direction other than the first direction is alignable in the projection direction.

Allowance of the claims is respectfully requested.

Conclusion

For the foregoing reasons, all the claims now pending in the present application are allowable, and the present application is in condition for allowance. Accordingly, favorable reexamination and reconsideration of the application in light of the remarks is courteously solicited.

If the Examiner has any comments or suggestions that could place this application in even better form, the Examiner is requested to telephone Brian K. Dutton, Reg. No. 47,255, at 202-955-8753.

Extensions of time

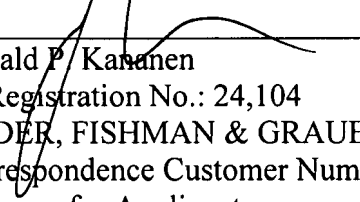
Please treat any concurrent or future reply, requiring a petition for an extension of time under 37 C.F.R. §1.136, as incorporating a petition for extension of time for the appropriate length of time.

Fees

If any fee is required or any overpayment made, the Commissioner is hereby authorized to charge the fee or credit the overpayment to Deposit Account # 18-0013.

Dated: April 3, 2007

Respectfully submitted,

By 
Ronald P. Kananen
Registration No.: 24,104
RADER, FISHMAN & GRAUER PLLC
Correspondence Customer Number: 23353
Attorney for Applicant